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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/553,751

08/11/2006

Yoshii Morishita

053244

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38834

7590

08/06/2009

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WASHINGTON, DC 20036

EXAMINER

BOHATY, ANDREW K

ART UNIT

PAPER NUMBER

1794

NOTIFICATION DATE

DELIVERY MODE

08/06/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentmail@whda.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/553,751	<b>Applicant(s)</b> MORISHITA ET AL.	
	<b>Examiner</b> Andrew K. Bohaty	<b>Art Unit</b> 4132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2005/10/18; 2006/04/24; 2006/12/12</u> .                      | 6) <input type="checkbox"/> Other: ____.                          |



## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 5 is indefinite because Formula (III) is not found in claim 2; therefore, claim 5 does not further limit claim 2. The claim will be as interrupted as Formula (III) found in claim 3, not claim 2.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi et al. (US 2003/0068527) (hereafter "Noguchi") view of Uckert et al. (US 2004/0204557) (hereafter "Uckert").

7. Regarding claims 1-3, Noguchi teaches a fluorescent polymer which can be a copolymer comprising of monomers defined by formulae (1) and (3) (paragraphs [0063] and [0075]). Regarding formula (3) Noguchi teaches that p can be zero, meaning only Ar<sub>5</sub> will be present (paragraph [0064]). Noguchi teaches Ar<sub>5</sub> can be a divalent heterocyclic compound (paragraph [0064]) and further illustrates quinolines as divalent heterocyclic compounds (paragraphs [0019] and [0020], compounds 49-63), indicating the copolymer could include a quinoline monomer unit. The quinoline monomers presented by Noguchi (compounds 49-63) may be substituted with a variety of substituents, including hydrogen (in applicant's case when a is zero), alkyl groups, alkoxy groups, alkylthio groups, alkylsilyl groups aryl groups, aryloxy groups, and heterocyclic groups (paragraphs [0026]-[0030], [0032], [0033], and [0037]), these groups correspond to the X groups defined in claim 2 by the applicant. Noguchi teaches a branched structured monomer with formula (1) (paragraphs [0010] and [0011]) and teaches specific examples of the branched structured monomer (compounds after paragraph [0060]), the branched structures of Noguchi have the structure one of the applicant's formulae (III) structures (see below). In Noguchi the branched structure can be connected to two quinoline monomer units and one vinyl aryl monomer unit (structures after paragraph [0060]). The branched structure monomer can be substituted with the same substituents as described above for the quinoline monomer,

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since in applicant's structures p can be zero, the Y group can be hydrogen (paragraph [0014]-[0016], and [0026]-[0030], [0032], [0033], and [0037]). The branched structures of Noguchi read on applicant's claim 3. Regarding applicant's formula (II), since b can be zero, D is not required in the polymer. Noguchi does teach that -O-, -S-, -NR-, -SiR<sub>2</sub>-, -CR<sub>2</sub>- can be incorporated into the polymer (paragraph [0074]).

8. Noguchi does not specifically teach a copolymer comprising a quinoline monomer and a branched structured monomer. Noguchi does teach a variety of monomers that can be used to make a fluorescent polymer, including both quinolines (compounds 49-63) and branched structured monomers (structures after paragraph [0060]) that have structures claimed by the applicant in claims 2 and 3 to provide a light emitting device with excellent quantum yield of fluorescence and light emitting efficiency (paragraph [0009]).

9. It would have been obvious to one of ordinary skill in the art at the time the invention was made to make a copolymer containing both a quinoline monomer and a branched structured monomer, wherein both the quinoline monomer and branched structured monomer can contain substituents and both monomers have structures that meet the claim limitations of formulae (I) and (III) in claims 2 and 3. Noguchi provides all the information needed to make a fluorescent polymer that can contain both a quinoline monomer and a branched structured monomer. The motivation would have been to provide a light emitting device with excellent quantum yield of fluorescence and light emitting efficiency.

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10. Regarding claim 4, Noguchi teaches the R groups in the quinoline monomer (compounds 49-63), can be hydrogen (the case when a is zero) (paragraph [0026]) or a linear, branched or cyclic 1 to 20 carbon atom alkyl group (paragraph [0027]) and the number of substituents besides hydrogen that can be attached to the quinoline monomer is from 0 to 6 (the are 2 a, so applicant claims 0 to 6 substituents as well).

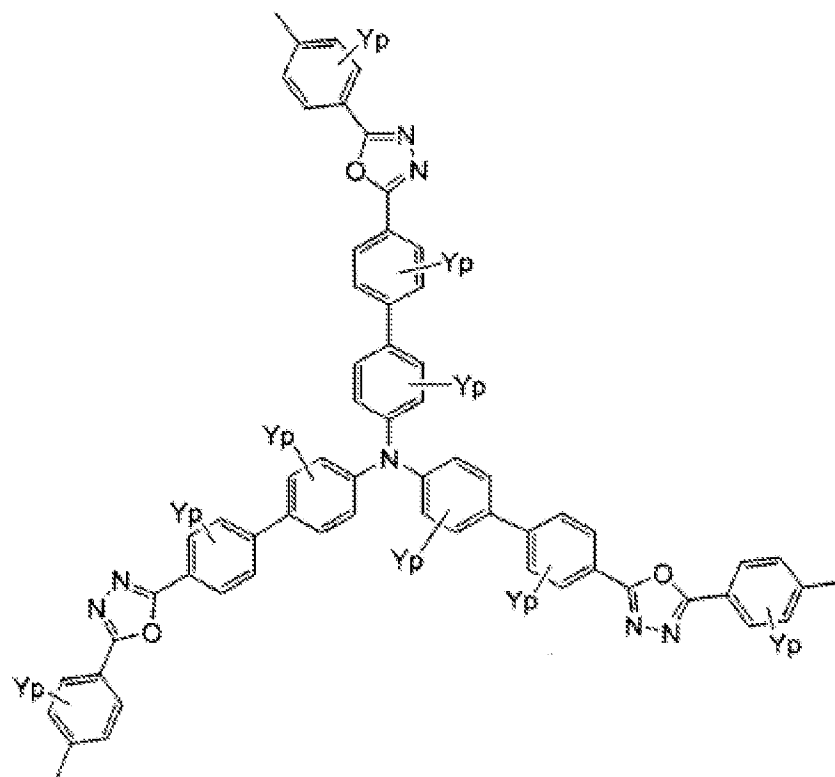
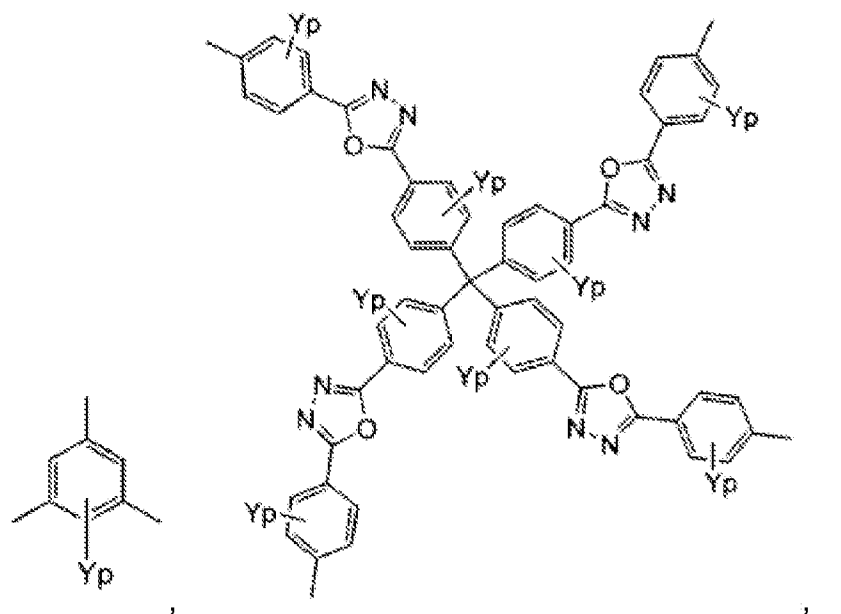
11. Regarding claim 5, Noguchi teaches the R groups of the branched structured monomer (structures after paragraph [0060], see formula (I) paragraphs [0014]-[0016] for determination of R groups) can be hydrogen (the case when a is zero) (paragraph [0026]) or a linear, branched or cyclic 1 to 20 carbon atom alkyl group (paragraph [0027]) and the number of substituents besides hydrogen that can be attached to the quinoline monomer is from 0 to 4 (or p is 0 to 4).

12. Regarding claim 6, Noguchi teaches the polymeric material can be used as a light emitting material of a polymer LED (an organic electroluminescent device) (paragraph [0078]).

13. Regarding claim 3, Noguchi teaches a fluorescent polymer containing a branched structured monomer and a quinoline monomer, see explanation above.

14. Noguchi does not teach branched structures corresponding to the structures below.

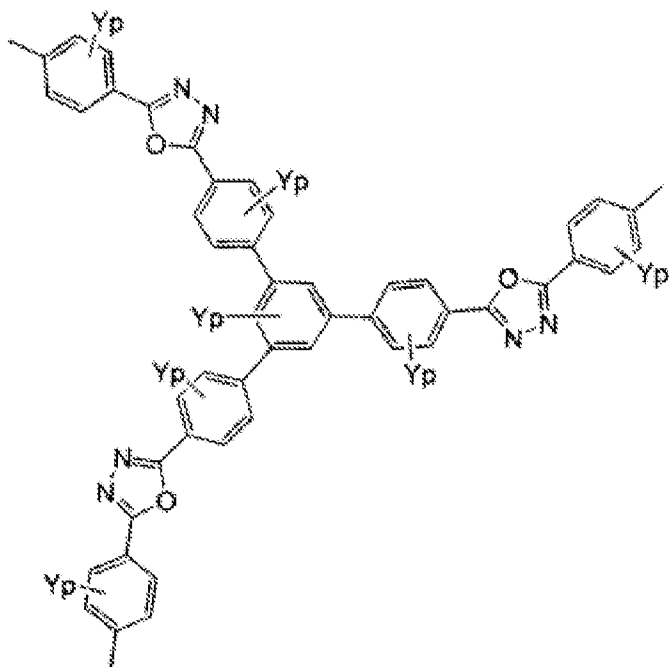
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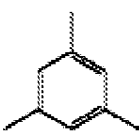
or



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15. Uckert teaches a polymer composition that can be used in an EL device (abstract) that contains a branched structured monomer unit (paragraph 0024]) of this

structure , where with respect to the applicant p is zero. Uckert teaches this monomer unit to provide an EL device with improved efficiency.

16. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the copolymer of Noguchi to include the branched structure monomer of Uckert. The motivation would have been to provide an EL device with improved efficiency.

### ***Double Patenting***

17. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

18. A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

19. Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

20. Claims 1, 2 and 3 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, and 6 of copending Application No. 10/561,019 (Morishita et al.) (US2006/0287498) (hereafter “Morishita”) in view of Noguchi et al. (US 2003/0068527) (hereafter “Noguchi”).

21. Regarding claim 1 of the instant application with respect to claim 2 of Morishita, Morishita claims a copolymer comprising a quinoline monomer.

22. Morishita does not claim a branched structured monomer.

23. Noguchi teaches a fluorescent polymer which can be a copolymer comprising of monomers defined by formulae (1) and (3) (paragraphs [0063] and [0075]). Regarding formula (3) Noguchi teaches that p can be zero, meaning only Ar<sub>5</sub> will be present

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(paragraph [0064]). Noguchi teaches  $Ar_5$  can be a divalent heterocyclic compound (paragraph [0064]) and further illustrates quinolines as divalent heterocyclic compounds (paragraphs [0019] and [0020], compounds 49-63), indicating the copolymer could include a quinoline monomer unit. Noguchi teaches a branched structured monomer with formula (1) (paragraphs [0010] and [0011]) and teaches specific examples of the branched structured monomer (compounds after paragraph [0060]). Noguchi teaches these polymers to provide a light emitting device with excellent quantum yield of fluorescence and light emitting efficiency (paragraph [0009]).

24. Given the teachings of Noguchi it would have been obvious of one of ordinary skill in the art at the time to invention was made to modify the copolymer claimed by Morishita to contain a branched structure monomer as taught by Noguchi to arrive at the claimed invention. The motivation would have been to provide a light emitting device with excellent quantum yield of fluorescence and light emitting efficiency.

25. Regarding claim 2 of the instant application with respect to claim 2 of Morishita, claim 2 of differs from claim 2 of Morishita for the same reasons claim 2 of Morishita differs from claim 1 of the instant application; therefore claim 2 of Morishita would be modified in the same way claim 1 was modified above to arrive at the claimed invention.

26. Regarding claim 1 of the instant application with respect to claim 6 of Morishita, Morishita claims a copolymer comprising a branched structured monomer.

27. Morishita does not claim a quinoline monomer in the copolymer.

28. Noguchi teaches a fluorescent polymer which can be a copolymer comprising of monomers defined by formulae (1) and (3) (paragraphs [0063] and [0075]). Regarding

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formula (3) Noguchi teaches that p can be zero, meaning only Ar<sub>5</sub> will be present (paragraph [0064]). Noguchi teaches Ar<sub>5</sub> can be a divalent heterocyclic compound (paragraph [0064]) and further illustrates quinolines as divalent heterocyclic compounds (paragraphs [0019] and [0020], compounds 49-63), indicating the copolymer could include a quinoline monomer unit. The quinoline monomers presented by Noguchi (compounds 49-63) may be substituted with a variety of substituents, including hydrogen (in applicant's case when a is zero) and alkyl groups, more specifically branched, linear, and cyclic 2 to 20 carbon atom alkyl chains (paragraph [0026] and [0027]), these groups correspond to the X groups defined the applicant. Noguchi teaches these polymers to provide a light emitting device with excellent quantum yield of fluorescence and light emitting efficiency (paragraph [0009]).

29. Given the teachings of Noguchi it would have been obvious of one of ordinary skill in the art at the time to invention was made to modify the copolymer claimed by Morishita to contain one of the quinoline monomers taught by Noguchi to arrive at the claimed invention. The motivation would have been to provide a light emitting device with excellent quantum yield of fluorescence and light emitting efficiency.

30. Regarding claim 3 of the instant application with respect to claim 6 of Morishita, claim 3 of differs from claim 6 of Morishita for the same reasons claim 6 of Morishita differs from claim 1 of the instant application; therefore claim 3 of Morishita would be modified in the same way claim 1 was modified above to arrive at the claimed invention.

31. This is a provisional obviousness-type double patenting rejection.

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32. Claims 1, 2, 4, and 6 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 4, and 6 of copending Application No. 10/553,640 (Morishita et al.) (US 2007/0003783) (hereafter "Morishita '783) in view of Noguchi et al. (US 2003/0068527) (hereafter "Noguchi").

33. Regarding claim 1 of the instant application with respect to claim 1 of Morishita '783, Morishita '783 claims a copolymer comprising a quinoline monomer.

34. Morishita does not claim a branched structured monomer.

35. Noguchi teaches a fluorescent polymer which can be a copolymer comprising of monomers defined by formulae (1) and (3) (paragraphs [0063] and [0075]). Regarding formula (3) Noguchi teaches that p can be zero, meaning only Ar<sub>5</sub> will be present (paragraph [0064]). Noguchi teaches Ar<sub>5</sub> can be a divalent heterocyclic compound (paragraph [0064]) and further illustrates quinolines as divalent heterocyclic compounds (paragraphs [0019] and [0020], compounds 49-63), indicating the copolymer could include a quinoline monomer unit. Noguchi teaches a branched structured monomer with formula (1) (paragraphs [0010] and [0011]) and teaches specific examples of the branched structured monomer (compounds after paragraph [0060]). Noguchi teaches these polymers to provide a light emitting device with excellent quantum yield of fluorescence and light emitting efficiency (paragraph [0009]).

36. Given the teachings of Noguchi it would have been obvious of one of ordinary skill in the art at the time to invention was made to modify the copolymer claimed by Morishita '783 to contain a branched structure monomer as taught by Noguchi to arrive

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at the claimed invention. The motivation would have been to provide a light emitting device with excellent quantum yield of fluorescence and light emitting efficiency.

37. Regarding claim 2 of the instant application with respect to claim 2 of Morishita '783, claim 2 of differs from claim 2 of Morishita '783 for the same reasons claim 1 of Morishita '783 differs from claim 1 of the instant application; therefore claim 2 of Morishita '783 would be modified in the same way claim 1 was modified above to arrive at the claimed invention.

38. Regarding claim 4 of the instant application with respect to claim 4 of Morishita '783, claim 4 of differs from claim 4 of Morishita '783 for the same reasons claim 1 of Morishita '783 differs from claim 1 of the instant application; therefore claim 4 of Morishita '783 would be modified in the same way claim 1 was modified above to arrive at the claimed invention.

39. Regarding claim 6 of the instant application with respect to claim 6 of Morishita '783, claim 6 of differs from claim 6 of Morishita '783 for the same reasons claim 1 of Morishita '783 differs from claim 1 of the instant application; therefore claim 6 of Morishita '783 would be modified in the same way claim 1 was modified above to arrive at the claimed invention.

40. This is a provisional obviousness-type double patenting rejection.

### ***Conclusion***

41. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew K. Bohaty whose telephone number is

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(571)270-1148. The examiner can normally be reached on Monday through Thursday 7:30 am to 5:00 pm EST and every other Friday from 7:30 am to 4 pm EST.

42. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael LaVilla can be reached on (571)272-1539. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

43. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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